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The present invention relates to new isostructural compounds having the general formula $A_nM_mM'_nQ_{2n+m}$ where A is a metal selected from the group consisting essentially of the alkali metals, lithium (Li), sodium (Na), potassium (K), rubidium (Rb), or cesium (Cs) or the transition metals silver (Ag) or thallium (Tl) and mixtures thereof, M is selected from lead (Pb), tin (Sn), germanium (Ge), calcium (Ca), strontium (Sr), barium (Ba), any divalent transition metal and mixtures thereof, M' is selected from bismuth (Bi), antimony (Sb) and mixtures thereof, and Q is selected from the group consisting essentially of sulfur (S), selenium (Se), or tellurium (Te) and mixtures thereof. These compounds possess an NaCl-type cubic lattice crystal structure where A, M and M' occupy the Na sites and Q occupies the Cl (chlorine) sites. This family of compounds combine isotropic morphology, an advantageous property for device processing, with low thermal conductivity and widely ranged electrical conductivity. Further, certain properties such as the electrical properties of the compounds can be controlled by varying the values for n and m. The isostructural compounds of the present invention are therefore good candidates for semiconductor applications in thermoelectronic devices, detectors, and photovoltaic cells, by way of non-limiting example.

IN THE CLAIMS

Please amend the claims in accordance with the following rewritten claims in clean form. Applicant includes herewith an Attachment for Claim Amendments showing a marked up version of each amended claim.

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- A2
1. (Amended) A conductive material having the general formula $A_nM_mM'_nQ_{2n+m}$

wherein:

A is at least one element selected from the group consisting of Li, Na, K, Rb, Cs, and Tl;

M is at least one element selected from the group consisting of Pb, Sn, Ge, Ca, Sr, Ba and any divalent transition metal;

A2
Cont. M' is at least one element selected from the group consisting of Bi and Sb;

Q is at least one element selected from the group consisting of Se, Te and S; and

n and m are any number greater than 0.

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12. (Amended) A solid solution comprising a conductive material having the general formula $A_n M_m M'_n Q_{2n+m}$ wherein:

A3 A is at least one element selected from the group consisting of Li, Na, K, Rb, Cs, and Tl;

M is at least one element selected from the group consisting of Pb, Sn, Ge, Ca, Sr, Ba and any divalent transition metal;

M' is at least one element selected from the group consisting of Bi and Sb;

Q is at least one element selected from the group consisting of Se, Te and S; and

n and m are any number greater than 0.

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17. (Amended) The solid solution of Claim 12 wherein the solid solution possesses a NaCl-type cubic lattice crystal structure.

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22. (Amended) A P-type conductive material comprising:

(a) a conductive material having the general formula $A_n M_m M'_n Q_{2n+m}$ wherein:

A5 A is at least one element selected from the group consisting of Li, Na, K, Rb, Cs, and Tl;

M is at least one element selected from the group consisting of Pb, Sn, Ge, Ca, Sr, Ba and any divalent transition metal;

AS Cont
M' is at least one element selected from the group consisting of Bi and Sb;

Q is at least one element selected from the group consisting of Se, Te and S;

and

n and m are any number greater than 0; and

(b) a dopant.

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24.

(Amended) An N-type conductive material comprising:

AG
(a) a conductive material having the general formula $A_n M_m M'_n Q_{2n+m}$ wherein:

A is at least one element selected from the group consisting of Li, Na, K, Rb, Cs,

and Tl;

M is at least one element selected from the group consisting of Pb, Sn, Ge, Ca,

Sr, Ba and any divalent transition metal;

M' is at least one element selected from the group consisting of Bi and Sb;

Q is at least one element selected from the group consisting of Se, Te and S;

and

n and m are any number greater than 0; and

(b) a dopant.

Please cancel Claims 5 and 13 without prejudice or disclaimer of the subject matter contained therein.

Please add the following new claims.

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32.

AM
(New) A solid solution comprising a conductive material having the general formula $A_n M_m M'_n Q_{2n+m}$ wherein:

A is at least two elements selected from the group consisting of Li, Na, Rb, Cs, Tl, and Ag;

M is at least one element selected from the group consisting of Pb, Sn, Ge, Ca, Sr, Ba and any divalent transition metal;

M' is at least one element selected from the group consisting of Bi and Sb; Q is at least one element selected from the group consisting of Se, Te and S; and

n and m are any number greater than 0.

97 Cont 31/ 30/ 33. (New) The solid solution of Claim 32 wherein Q is at least two elements selected from the group consisting of Se, Te and S.

32/ 30/ 34. (New) The solid solution of Claim 32 wherein M' is Bi and Sb.

13/ 30/ 35. (New) The solid solution of Claim 32 wherein M is at least two elements selected from the group consisting of Pb, Sn, Ge, Ca, Sr, Ba and any divalent transition metal.

34/ 30/ 36. (New) A semiconductor device comprising the solid solution of Claim 32.

35/ 30/ 37. (New) An infrared detector comprising the solid solution of Claim 32.

36/ 30/ 38. (New) A photovoltaic element comprising the solid solution of Claim 32.

37/ 30/ 39. (New) A thermoelectric device comprising the solid solution of Claim 32.

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40. (New) A conductive material having the general formula $A_n M_m M'_n Q_{2n+m}$ wherein:

A is at least one element selected from the group consisting of Li, Na, K, Rb, Cs, Tl, and Ag;

M is at least one element selected from the group consisting of Pb, Sn, Ge, Ca, Sr, Ba and any divalent transition metal;

M' is at least one element selected from the group consisting of Bi and Sb; Q is at least one element selected from the group consisting of Se, Te and S; and

n and m are integers greater than 0.

am
Cont

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41.

(New) The conductive material of Claim 40 wherein A is Ag, M is Pb and M' is

Bi.

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(New) A semiconductor device comprising the conductive material of Claim 40.

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(New) An infrared detector comprising the conductive material of Claim 40.

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(New) A photovoltaic element comprising the conductive material of Claim 40.

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(New) A multispectral sensor comprising the conductive material of Claim 40.

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46.

(New) A thermoelectric device comprising the conductive material of Claim 40.

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